Implementation of Project Based Learning (PBL) in EFL (English as a Foreign Language) Classrooms in Fezalar Educational Institutions (Iraq)

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Abstract: This paper encompasses a theoretical background of PBL (Project-Based Learning) with advantages and disadvantages of PBL implementation. Contemporary implementation of PBL (Project-Based Learning) becomes widespread in general education, especially in EFL (English as a Foreign Language) classes not only to provide innovative English language acquisition through PBL, but also to equip learners with 21st century skills, such as communicative competence, critical thinking, life-long learning, team-working and problem-solving skills. This paper also deals with implementing PBL (in English lessons and other disciplines in Fezalar Educational Institutions. The paper includes an interview with Educational Coordinator of Fezalar Educational Institutions.

Keywords: Communicative Competence, EFL Classroom, Project-Based Learning

1. Introduction

English has become the most important international language, widely used throughout the world. People with different first languages try to use English as a lingua franca to communicate with each other. If people want to go ahead in their professional lives, then English is an unavoidable step in the process. Hence, the demand for a high proficiency in the use of English has become very important. Educators attempt diverse teaching approaches. Project-Based Learning is one of the approaches. Current researches (Simpson, 2011; Rousová, 2008; Thomas, 2000; Ke, 2010) show that PBL can be more effective than traditional instruction and it is a valid approach to improve the English language proficiency.

However, with each passing day new electronic devices, a wide range of attractive mobile phones, innovation in technology, it is becoming complicated to attract students’ attention to lessons, make them do their homework properly. Project-Based Learning is an effective way to help students understand, apply and retain information. Those who work on projects show increased motivation and engagement in their studies.

2. Literature Review

“When students are challenged to get to work solving real-life problems, the whole world becomes a classroom. See students at work writing in online journals, doing research on the Internet, meeting in
groups to plan and create Web sites and digital media presentations, and evaluating their peers for collaboration and presentation skills. This setting and these types of activities have a name and a purpose. It is called project-based learning, and it is designed to engage students and empower them with responsibility for their own education in ways unheard of in traditional classrooms” (Solomon, 2003, p.1-2).

Project-based learning is a comprehensive instructional approach to engage students in sustained, cooperative investigation (Bransford & Stein, 1984). In a simple way, project-based learning is a job that provides connection between a group of learners and gives them some opportunities like taking about the issue close to their hearts, step by step finding out a response and being able to present the results to a wider audience. During the process of preparing and organizing projects students generally encourage and morally support each other when they face the frightening prospect of a public presentation.

According to Collins, Brown and Newman (1989) project-based learning is an approach that allows learners to identify and formulate their own problems. The goals they set as well as the unexpected discoveries they will make during interaction with the environment serve as guides.

Projects usually require several steps and some duration - more than a couple of days and up to a semester. Projects also require cooperative group learning. They may focus on development of a product or performance and require students to conduct research, to solve problems, and to synthesize information. Although projects as a methodology are not a new concept, the model is an effective application to support many tasks facing teachers today by applying authentic assessment, infusing higher-order thinking skills, guiding life choices, and providing experiences that tap individual student interest (Agustina, 2012).

Thomas (2000) emphasized that Project-Based Learning should rely on the curriculum. It is a teaching and learning model; a curriculum development and instructional approach that emphasizes student-centered instruction by assigning projects.

For the students doing a project awareness of their own abilities, probing and representing endings, showing self-confidence that comes from being able to map out a project and seeing it come to fruition is essential. Moreover, it is the joy and frustration of working with others; the pride in gaining important knowledge and insights; the enthusiasm generated by mastering new technologies; and, in the case of presentations of a personal nature, the excitement of sharing a story worth telling.

What is a Project-Defining Term?

- A project is making a plan, doing teamwork and collaboration, trying out and implementing systematic evaluation, reflection, product, and display.
- It is a display of task outcome.
- A project is a job where students decide on the process steps, critical aspects and tasks.
- A variety of language skills should be integrated.
- Students with different ability levels should be able to adapt.
- A project also can be carried out alone in a one-to-one setting, the final results can be displayed.
To fulfill the project task, besides improving language skills, projects also improve students’ reporting skills—*Reflective Learning*.

The answer to the question ’Why do Projects?’ is as follows:

- Project work generally motivates students, especially teens.
- Students enjoy doing project work rather than traditional prescriptive work.
- Project is one of the ways to make shy and low-achiever students do great work in a group.
- Project work goes well with CLIL (Content and Language-Integrated Learning).
- Projects are an effective way of learning, because they are more memorable than simple tasks.
- Projects are meaningful links to students’ lives.
- Projects give an opportunity for acceleration to students who are eager to have a fast improvement, students pay more attention and take more seriously projects than everyday routine assignments.

3. **What is Project-Based Learning?**

Then next question is the most important issue, the main aim of the article was to find out answers to the questions: what is Project Based Learning, why do we need to implement it in teaching English as a Foreign Language.

Today’s students who are the future-generation employees or employers, so they should enhance skills like: critical thinking, to be able to see the hidden aspects of a problem, problem-solving, to be able to overcome obstacles, and team-work, to be able to work in harmony with others. And PBL can become a tool for solving problems that people encounter in real life (Rousova, 2008).

Implementing the PBL approach in schools is a path which leads students to the PBL advantages highway. Furthermore, PBL helps students to internalize the above-mentioned skills through preparing, carrying out and presenting their projects.

According to Simpson (2011), the PBL approach opens the door to: communicative competence, authentic learning, learner autonomy, cooperative and collaborative learning, higher-order thinking skills, language proficiency, self-efficacy and self-esteem.

The goals of PBL are broader, however, simply than the development of content knowledge. This approach aims to take learning one-step further by enabling students to transfer their learning to new kind of situations and problems and to use knowledge more proficiently in performance situations (Barron & Darling-Hammond, 2008).

The project opens a door, allowing students to interact with their topic on a level that pushes their comprehension and involvement deeper. It may encourage students to become more fully cognizant of their own belief system (Minerich, 2001).

The ability to develop multiple and alternative perspectives on a problem is also a central skill for performing tasks. Collaborative learning promotes the exchange and reflection on different views. As
project work is often done in teams, learners train their capabilities for team-work and collaboration (Henze & Nejdl, 1998).

PBL places demands on learners and instructors that challenge the traditional practices and support structures of schools. Learning from doing complex, challenging, and authentic projects requires resourcefulness and planning by the student, new forms of knowledge representation in school, expanded mechanisms for collaboration and communication, and support for reflection and authentic assessment (Minerich, 2001).

According to the above definitions, PBL opens the door from disciplinary to authentic life. It assists learners to ‘get field of study competence’. Moreover, it correlates theory with practice.

PBL is often used to teach content-based subjects (mainly, sciences). However, there is a question about the connection between PBL and EFL/ESL teaching or how the most beneficial aspects of PBL can be used and implemented in EFL/ESL teaching?

4. **Merits of Using PBL in the ESL/EFL Classroom**

Undoubtedly, our learners as 21st century students should be well equipped not only with good English language skills, but also with other necessary skills which current technological and competitive century requires.

According to Edutopia online article *Why is Project-Based Learning Important?* (2007), the old school model of passively learning facts and reciting them out of context is no longer sufficient to prepare students to survive in today’s world. Solving highly complex problems requires that students have both fundamental skills (reading, writing, and math) and 21st century skills (teamwork, problem solving, research gathering, time management, information synthesizing, and utilizing high tech tools). With this combination of skills, students become directors and managers of their learning process, guided and mentored by a skilled teacher.

The required skills include personal and social responsibility, planning, critical thinking, reasoning, and creativity; strong communication skills, both for interpersonal and presentation needs; cross-cultural understanding, visualizing and decision-making, knowing how and when to use technology and choosing the most appropriate tool for the task.

However, we as teachers observe everyday, that TV, the Internet and social media have negative effects on learners’ attention and lesson concentration. Nowadays students have deficit of full attention and concentration. They understand and remember less and they have difficulties applying their learning to new contexts. Students cannot resist multitasking, and it is impairing their memory.

Luckily, PBL approach is one of the ways and solutions that can help teachers and students to achieve a high level of concentration and focus on tasks. Furthermore, it is difficult for EFL instructors to make their classes a place where effective learning takes place in an enjoyable way. Students, who sit for hours without movement often complain about classes being ‘boring’, especially for younger learners, who have a short attention span.
5. The Advantages and Disadvantages of Project Based Learning Advantages

5.1 Advantages

Project-based learning benefits teaching English as a second or foreign language have been widely recognized. Fragoulis (2009) viewed other authors’ ideas about the important positive effects of PBL in teaching English as a foreign language. A frequently mentioned benefit is improved language skills. Because students engage in purposeful communication to complete authentic activities, they have the opportunity to use language in a relatively natural context and participate in meaningful activities that require authentic language use (Haines, 1989). Authentic activities refer to activities designed to develop students’ thinking and problem-solving skills, which are important in out-of-schools contexts, and to foster learning to learn (Brown et al, 1993).

PBL is based on authentic activities. While activities are anything that students are expected to do beyond getting input through reading or listening, in order to learn, practice, apply, evaluate, or in any other way respond to curricular content (Brophy & Alleman, 1991), authentic activities are tasks with real world relevance and utility that integrate across the curriculum, that provide appropriate levels of complexity, and that allow students to select appropriate levels of difficulty or involvement (Jonassen, 1992). Among other characteristics, authentic activities have real-world relevance, provide the opportunity for students to examine the task from different perspectives, enhance collaboration and reflection, and allow competing solutions and diversity of outcome. In addition, project-based learning provides opportunities for the natural integration of language skills (Fragoulis, 2009).

The findings in the Simpson’s study, which investigated whether PBL could enhance students’ English language skills, indicate that the students further developed their listening and speaking skills while applying the PBL approach. The effect of collaborative learning also greatly influenced students’ reading and writing development (Simpson, 2011).

The obvious attraction of PBL is the motivating element, especially for younger learners. Projects bring facts to life. The American educational theorist, John Dewey, wrote: “education is not a preparation for life; education is life itself” (Dewey, 2004, p. 48). Project work allows “life itself” to form part of the classroom and provide hundreds of opportunities for learning. Apart from the fun element, project work involves real life communicative situations, (analyzing, deciding, editing, rejecting, organizing, and delegating) and often involves multi-disciplinary skills, which can be brought from other subjects. All in all, it promotes a higher level of thinking than just learning vocabulary and structures (Bilsborough, 2013).

PBL plays an important role in developing learners’ target language for real-life purposes. It helps language students become more competent in the use of the target language and promotes learners’ autonomy, centeredness, motivation and integrated skill practice (Sheppard & Stoller, 1995).

PBL has been described as an effective way of engaging in “simultaneous acquisition of language, content and skills” (Beckett & Slater, 2005, p. 108). PBL would, therefore, help language learners relate to the task, to the language in the learners’ communicative competence and make the language more relevant to their needs and enable them to communicate and understand the target language’s culture (Hutchinson, 1996).
Students’ team-building skills, which are must-have abilities in the future work environments, easily develop in PBL as a successful project can be fulfilled only in a well-organized teach, with distributed functions and mutual support. Learners are able to observe how their ideas, plans, suggestions and thoughts can be successfully adopted and carried out to fulfill projects. They are more independent than in traditional learning, which helps them to build decision-making abilities. They are also able to interact with each other freely. Students get to know their peers better.

5.2 Disadvantages

Although there are many benefits to PBL, there are also some disadvantages that should be taken into consideration before using this approach in the classroom. Thomas (2001) indicates that there is a considerable amount of work and background research that must occur before projects are implemented in the classroom. Careful management and implementation of the projects is essential for student success. Student activities have to be structured to facilitate students’ success and meaningful learning and must be examined on a constant basis as they progress through the project stages. In addition, PBL is taxing for many teachers and can increase the time spent on classroom preparation and assessment two-fold (Marx, Blumenfeld, Krajcik, & Soloway, 1997).

Independent as it seems, PBL may get stuck without teacher’s tactful guidance (recommendations on where to find resources, what kind of resources are reliable, how to sum up the collected data, etc.). If teachers are not properly trained or equipped with needed skills and abilities, they might not be able to help their students learn key concepts effectively.

As PBL requires teamwork, some disagreements or clashes may happen, and conceivably, it may be difficult for teachers to detect and realize these features in the implementation of PBL. It is hard to assess how much each learner contributes to a group project, which could mean that while some students are learning and trying to work, others are taking the easy way out and letting their peers do the mental heavy lifting. Parents might struggle to fathom and determine how best to help their students or they might not have sufficient education to be able to show the way or to support students.

Furthermore, students may not be inspired to complete their projects. Lack of interest or motivation will lead them astray in the World Wide Web, and they may get distracted. Accessing inappropriate or irrelevant material may also pose a problem. Teachers must prepare for all sorts of problems and eventualities, including methods to get students back on track.

6. Teacher & Student Roles in PBL

At the end of 21st century, the teacher’s role no longer includes just delivering instruction or expecting students to repeat facts on tests. Instead, it is to offer resources that help students investigate and develop content purposefully and creatively.

Being a teacher is one of the most important and demanding professions. Regardless of the time or social system, teachers come just after parents to help children integrate into society, to gain necessary knowledge, skills, abilities, attitudes, to arouse interests and to establish the sense of moral and cultural values.
Methodology books enumerate many roles of a teacher, including that of a manager, organizer, controller, prompter, assessor, participant, resource and investigator. The last one deserves further attention because of the constant development and improvement that is connected with this role. After several years of teaching, the job might fall into a dry and uninspiring routine, and a teaching style becomes rigid and mechanical. A teacher may completely burn out. Regular self-reflection should help avoid this situation. It is suggested that a reflective teacher with a flexible approach is innovative, creative, and open to new trends and methods. One possible guideline how to ‘keep out of the way’ is definitely applying PBL, which is so inspiring and student–oriented. A special attention devoted to the division of rights and responsibilities gives evidence of a democratic essence of PBL.

A few general observations concerning teacher’s role in PBL are described in Haines (1989). The largest single factor in successful project work is the teacher’s belief in and commitment to this approach. Then it must be ensured that students are mature enough to work in this way and prepared thoroughly in advance. This also includes the ability of self- and peer-correction. Haines explains that, while projects are in progress, the teacher should act as a reference source, alongside dictionaries and grammar books. By contrast, toward the end students need to realize that accuracy is important to the communicative effectiveness of their work, and the end-product language should be as accurate as possible.

Project-Based Learning Handbook by Markham (2003) defines teacher’s role as follows: “At the heart of successful PBL is teacher’s ability to support and direct students. This requires instructional, organizational, interpersonal and communication skills, as well as the ability to define the agenda for the class and push a project through to a successful conclusion. It also includes being sensitive to the fact that students finish work at different rates, with different abilities, aptitudes, and learning styles”. Overall, PBL requires the teacher to adopt a new, enthusiastic attitude, to acquire a wide range of skills and to leave the traditional supreme position. It might be said that ‘leadership’ is replaced by ‘partnership’ in PBL. Going back to the idea of CLL (Community Language Learning), the teacher should really act as a counsellor, an assistant, an adviser or a consultant, being prepared to give advice and help with overcoming all difficulties and obstacles. It is his /her duty to coordinate and facilitate the whole process.

7. PBL in Fezalar Educational Institutions

7.1 Background

Fezalar Educational Institutions (2014) is a network of private schools in Iraq opened in 1994. They are currently serving approximately 14,000 students in 33 different campuses. It has also involved Ishik University since 2008.

In Fezalar Educational Institutions, teachers communicate with students even more than parents, because students spend more time with their teachers than with their parents. From 8:00 (a.m.) until 15(p.m.), they have lesson time, then guidance lessons, guidance activities and programs. The communication language in these extracurricular activities is generally English. On Saturdays, there are extra English courses, PET, KET and FCE official exams preparation courses and practice for the Olympiad (Young Communicators-Fezalar Educational Institutions interschool English Language Competition). Our teachers are not only English or subject-matter teachers; they are also advisors and guides of students.
Iraqi students generally have rote memorization learning styles. They can memorize a long vocabulary list, texts, reading parts, and even writing samples. They also prefer to do drills. But all these are mostly forgotten not long thereafter, as the activities are not meaningful for them. A teacher-centered approach to learning is mostly dominant in Iraq. The above learning style and approach do have their benefits, but, at the same time, they create great obstacles in providing a critical thinking atmosphere for learners. Henceforth, Fezalar Educational Institutions try to improve the education system by using piloting PBL in primary school and TTC (Teacher Training Courses). Furthermore, PBL books are used in secondary schools (Hutchinson, 2009). Moreover, Fezalar carry out assessment not through only traditional exams, but also through Cambridge English Language Assessment Tests such as:

KET – Key English Test for (Secondary Prep-Classes and High Prep-Classes)

PET- Preliminary English Test for (7, 8 Grades)

FCE- First Certificate in English for (10,11 Grades)

IELTS - International English Language Testing System (for teachers)

The success in Cambridge English Exam provides Fezalar students with an internationally recognized certificate showing the level they attained in English. Hence, Fezalar aims to make our students successful in these tests and up-to-date teaching methods, instead of using deeply teacher-centered approaches, like rote learning and memorization. Fezalar Educational Institutions have introduced, in particular, Project Based Learning.

In Fezalar, PBL implementation is connected with Ali Chavdar (Educational Coordinator of Fezalar Educational Institutions) who suggested to Mehmet Agpak (Fezalar Teacher Professional Development Center Coordinator) to try PBL in Fezalar. It was first implemented in Briyati Primary School in 2012-2013 educational year for teaching English, in 2013-2014 the project went on, involving teachers of other subjects as well. According to my interview that I held, implementation was considered successful by administrators of Fezalar, parents, and teachers. This enabled Fezalar to introduce PBL all 33 schools, to teach various subjects, including English. Of course, to be really effective, this experience needed a scientific investigation.

7.2 Method

Therefore, I decided to hold an interview with the initiator of PBL approach in Fezalar Educational Institutions Ali Chavdar (he agreed to mention his name). The interview involved such issues as getting information, materials, teachers’ feedback. Ali Chavdar is at the same time is one of the co-authors of dozens of educational math books in English used in Turkish schools all over the world.

The researcher used qualitative instrument- semi-structured interview not to limit the respondent and allow him to discuss some issues that researcher may not have considered beforehand. The interview was conducted in the interviewee’s native language in order to allow the interviewee to express his opinions easily. The interview was also recorded, transcribed, then translated and checked by a native speaker, instructor from Ishik University (his 2014 TOEFL score is 107) and by my PhD supervisor.
1. Why did Fezalar decide to implement PBL?

Ali Chavdar: The educational system in Iraq is generally based on rote memorization. Students often get high marks in quizzes, final exams and even in matriculation exams by memorizing books word by word. Moreover, students were literally memorizing quantitative subjects like math, physics, and chemistry where students are usually required to use their logic. As Fezalar Institutions, we realized that teacher-centered and memorization dominant education system is a big drawback and obstacle for students’ social, technological and educational development. One of the aims of Fezalar Education Institutions is to increase students’ high-order thinking, such as critical thinking, creativity and team-working skills.

The biggest obstacle in the PBL implementation in our schools might be our students’ educational background. They usually come from a system they could get the highest grades with rote memorization. Thus, projects might be considered as a time-wasting activity.

2. Do you think it is possible to overcome this obstacle?

Ali Chavdar: In Iraq, a mandatory exam is held in the end of the 12th grade of High School, and the whole system of education is like preparation to this exam. In such conditions the implementation of PBL in the last level of High school is too hard. Students start learning required topics and easily start memorizing questions, which are asked at matriculation. To change the situation, PBL should not be separate from the curriculum, but become part of it. Then students will not only successfully pass the exam, but also develop a high-level autonomy in the learning process, so necessary during the rest of life.

3. What are advantages and disadvantages of PBL in Fezalar?

Ali Chavdar: At Fezalar we have not encountered with any grave problems. However, PBL implementation has brought countless advantages:

a. Students learn how to work systematically by doing project work. At the beginning, the teacher supports students, and then students start doing it by themselves. They start, proceed and are able to fulfill the task. It means through the years of PBL implementation, students will be able to bring their tasks to completion by him/herself with less help of teachers and family. In fact, at the end of High School, students who are in PBL teaching approach solve problems more easily. They know how to start, to progress and complete any task from the beginning until the end.

b. Teachers, school administration, parents and students collectively participate in the implementation of PBL. It is not only team-work between students. Sometimes students need their parents’ help. Doing a project is connected with the home and the outside. Altogether, internal and external aspects are under the umbrella of the education process.

c. School environment becomes more attractive visually with students’ projects exhibited in the school building. Furthermore, exhibited projects help students learn through the work of their peers.

4. Above you mentioned school administration contributions, what are they?
Ali Chavdar: The school administration assigns the available space for PBL implementation, provides opportunities, classes designed for Project-based learning, students’ desks, teachers’ table, boards, pasteboards and colorful papers. Facilities are provided for PBL implementation. Before PBL implementation, classes were small, lessons were handled in a monolog way. So after this project, in Fezalar the classrooms have become wider and bigger for Project Based Learning. In addition, administration tries to be in constant engagement with parents.

5. What are parents’ reflections about PBL implementation?

Ali Chavdar: I want to use my own daughter as an example, Aliye Naile Chavdar. At the 1st and 2nd classes, she was in school teaching in the traditional way, where the education approach was teacher-centered and lessons were handled in a monologue way. In the 3rd grade, she moved to a school applying PBL. As parents, we immediately realized differences and effects. She used to go to school reluctantly, but now, she is highly enthusiastic to go to school.

6. What is the reason of being so highly motivated?

Because my daughter has entered a more colorful and interesting world with interesting materials, like scissors, colorful papers, pasteboards, and kits. My daughter’s homework generally used to be writing some tasks. However, with PBL, the style of homework has changed.

7. So, can we say that PBL is more successful in Primary Schools?

Ali Chavdar: PBL is especially successful in Primary Schools, but, for each age, proper projects can be adapted. Furthermore, those students who are in PBL, have participated in International Projects’ Competitions and have been awarded more than 40 medals. That it is the accomplishment of PBL implementation in our schools.

8. What is the effect of PBL implementation in English Language Teaching programs in our schools?

Ali Chavdar; currently the books that we use for English Language Teaching are Project Based Learning Books (Oxford University Press), Project 1, 2, 3- Preparatory Class, Project 4- Grade 7, and Project 5- Grade 8.

Hence, we have to implement PBL, and these books help us quit the old style of teaching the English language. Moreover, this year our implementation of PBL showed its success in International exams (KET, PET, FCE). The general exam average of Fezalar Educational Institutions students have become higher since we started the application of PBL. Moreover, as teacher and parent feedback shows that our students demonstrate their communicative competence during their abroad trips.

8. Discussion

The current study showed that PBL implementation was successful in Fezalar Educational Institutions Primary and Secondary Schools. According to Ali Chavdar, Educational Coordinator of Fezalar Educational Institutions, the implementation had countless advantages.
Teachers report that students not only enhanced their language skills, but also their social communicative skills. Furthermore, PBL implementation distinguishes Fezalar by shifting students away from the standard classroom monolog and dominant rote-memorization system towards modern real-life context and analytical, critical, synthesis thinking. In addition to this application, Fezalar Institutions cultivate among their learners not only improved English Language skills, but also more important abilities, such as: the ability to plan, start, systematically do, fulfill the task and be able to present it in a proper way. These skills will help them not only to survive, but also to go ahead confidently in this competitive and relentless 21st century.

9. Conclusion

The administration believed that the implementation of PBL was appropriate for schools of Fezalar. The project can help students recognize their own English ability and improve English language skills in real life contexts. Moreover, with PBL implementation, students’ monotone and dull school life becomes more colorful and attractive and PBL incentivizes and motivates students.

10. Recommendations and Next Step

There are some points worth considering. The suggestions are:

- PBL can and should be applied in order to develop students’ higher-order cognitive skills, cooperative skills, the ability to deal with real-life problems.
- In EFL classes, besides these life skills, PBL helps to improve language (listening, speaking, reading, and writing skills, with their pronunciation, vocabulary and grammar components). It permits to use authentic language materials and improves communication skills.
- PBL provides a cross-disciplinary approach, due to which the subjects studied at school are not simply separate subjects, but the bases for dealing with problems that arise in various spheres of life.
- The observation over PBL application and the interview held pointed out that PBL has been quite successful in Primary and Secondary Schools of Fezalar, but encountered some hindrances high grade students, 12th grade of high school students. The reason for this is that in Iraq education system the 12th grade is perceived as a year of memorizing exam questions, so the students were not motivated to be involved in time-consuming projects. It is essential that school not simply prepares students to pass exams and get a school certificate and probably become a university student, but gives an opportunity to students to have peer-work, team-work by doing projects which would assist to reduce students stress and anxiety and prepare them for solving life problems.
- PBL, to be effective, should become part of the curriculum.

Further studies, of course, are needed, which may focus on implementing PBL both at school and at higher education institutions, on measuring its efficiency, on selecting topics adequate for various student ages, and on finding ways to overcome its disadvantages. The efficiency of PBL compared to traditional education also has to be studied by quantitative methods.
References


